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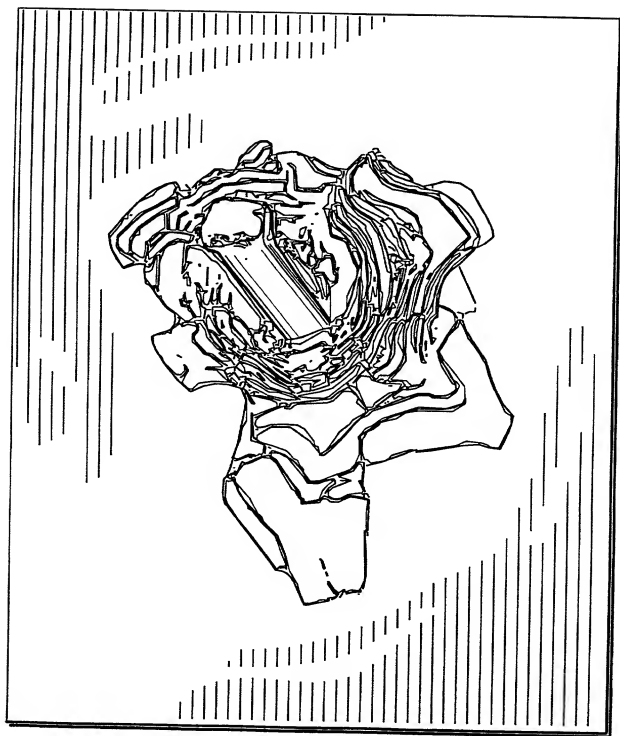


FIG. 1

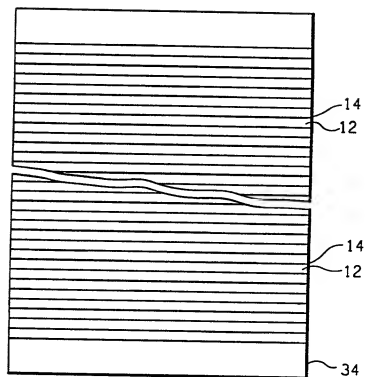


FIG. 2

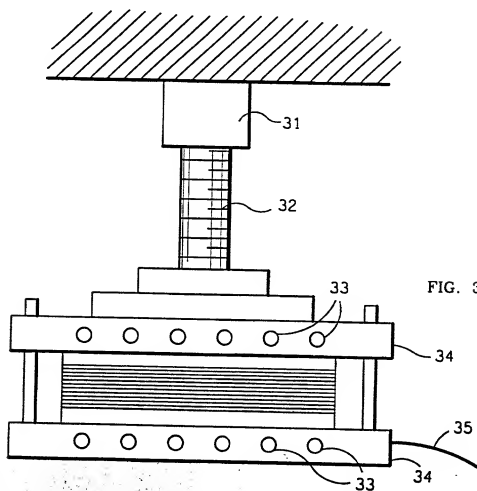


FIG. 3

FIG. 4

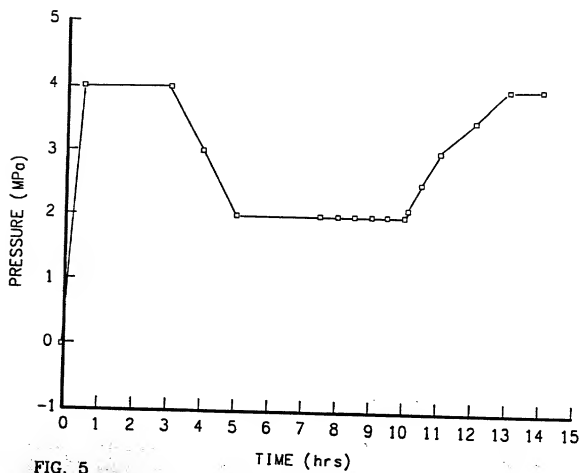
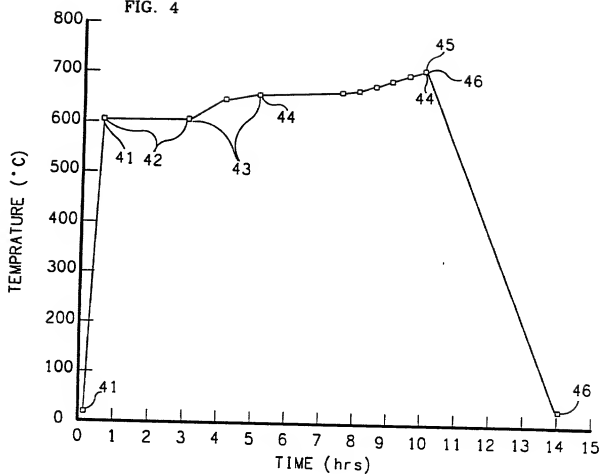


FIG. 5

Table 1. Typical values of plane strain fracture toughness,  $K_{IC}$ , at room temperature (for illustration purposes only)

MATERIALS	E (GPa)	$\sigma_y$ (MPa)	$K_{IC}$ (MPa)	$T_{IC}$ (mm)	L (mm)
<b>Steels</b>					
Medium carbon (AISI-1045)	210	269	50	55	88.0
Pressure Vessel (ASTM-A5330-B)	210	483	153	16.0	256.0
High Strength Alloy (AISI-4340)	210	1,593	75	0.4	6.4
Maraging Steel (250-Grade)	210	1,786	74	0.3	4.8
<b>Aluminum Alloys</b>					
2024-T4					
7075-T651	72	330	34	1.7	27.2
7039-T651	72	503	27	0.5	8.0
<b>Titanium Alloys</b>					
72	72	338	32	1.4	22.4
<b>Ti-6AL-4V</b>					
Ti-6AL-4Mo-2Sn-0.5 Si	108	1,020	50	0.4	6.4
Ti-6AL-2Sn-4Zr-6Mo	108	945	72	0.9	14.4
<b>Polymers</b>					
108	108	1,150	23	0.1	1.6
PS	3.25				
PMMA	3 - 4		0.6 - 2.3		
PC	2.35		1.2 - 1.7		
PVC	2.5 - 3		2.5 - 3.8		
PETP	3		1.9 - 2.5		
			3.8 - 6.1		
<b>Ceramics</b>					
Si3N4					
SiC	410		43-65		
Al2O3					
Soda-Lime Glass	360		30-75		
WC - 15 wt% Co (cermet)	570		16 - 18		
Electrical Porcelain	-		1		

Figure 6  
PRIOR ART

TABLE 2

KNOOP MICROHARDNESS DATA FOR  
NICKEL AND NICKEL INTERMETALLIC PHASES FOR HOT-PRESSED NI-AL DISKS  
AND  
TITANIUM AND TITANIUM INTERMETALLIC PHASES FOR HOT-PRESSED TI-AL DISKS  
(25 g load)

Phase	$H_{K25}$ (kg/mm <sup>2</sup> )
Ni	135
Ni (Al)	170
Ni <sub>3</sub> Al	424
NiAl	450
Ti	150
Ti (Al)	300
Ti <sub>3</sub> Al	420
TiAl	590
TiAl <sub>3</sub>	700

Figure 7  
PRIOR ART

FIG. 8a

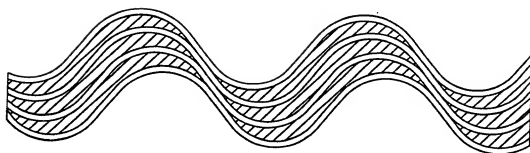
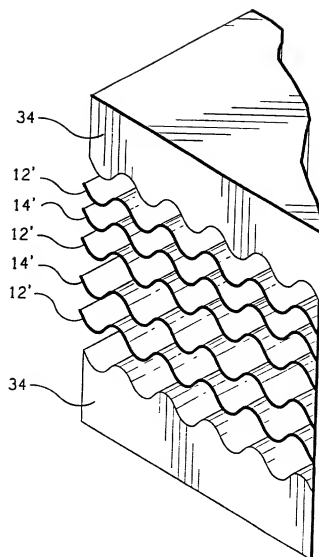


FIG. 8b